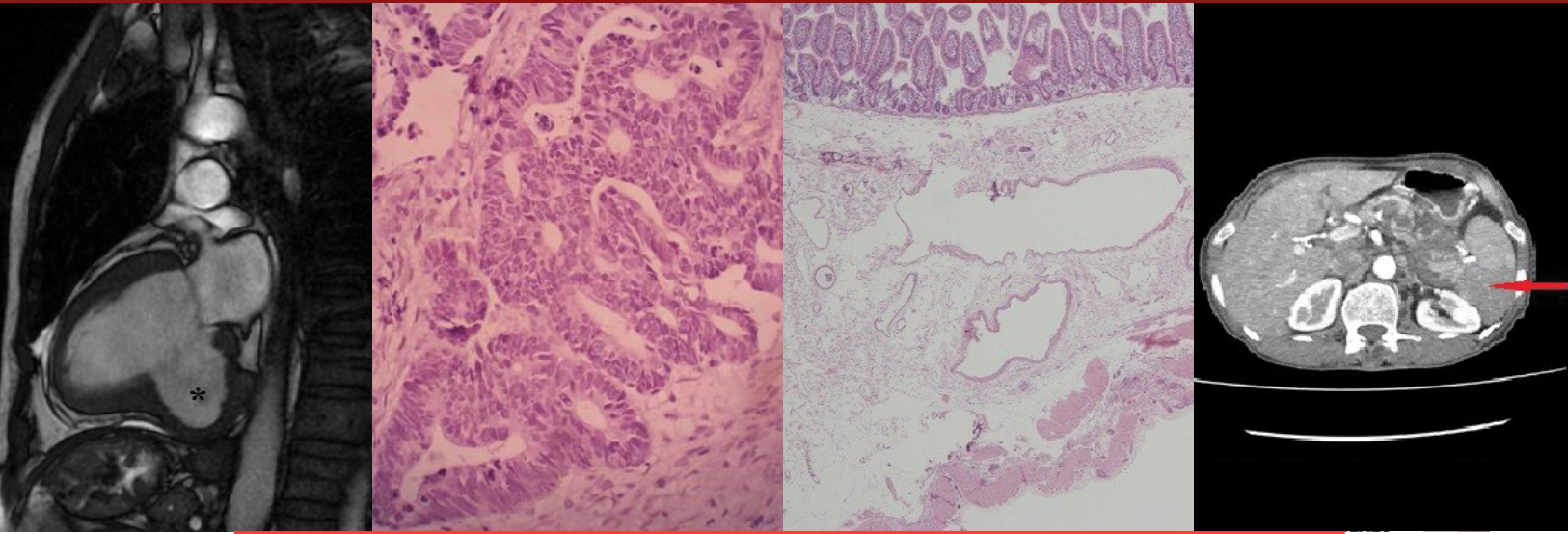




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VOLUME 1 • ISSUE 2 • AUGUST 2016



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Publication Type
Local periodical

Printed Date
August 2016

Printed at

Share Ajans, Şehit
Fevait Alı Sok. Dük.
No: 4 C, Sönmezler Apt,
Göçmenköy, Nicosia,
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The Cyprus Journal of Medical Sciences aims to publish manuscripts at the highest clinical and scientific level on all fields of medicine. The journal publishes original papers, review articles, case reports and letters.

Editorial and publication processes of the journal are shaped in accordance with the guidelines of the international organizations such as the International Council of Medical Journal Editors (ICMJE), the World Association of Medical Editors (WAME), the Council of Science Editors (CSE), the Committee on Publication Ethics (COPE), the European Association of Science Editors (EASE).

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Limitations, drawbacks and shortcomings of original articles should be mentioned in the "Discussion" section before the conclusion paragraph.

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Standard journal article: Journal titles should be abbreviated in accordance with journal abbreviations used in Index Medicus (for journal abbreviations consult List of Journals indexed by MEDLINE published annually by NLM at <http://www.nlm.nih.gov/tsd/serials/lji.html>). When there are six or



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Books:

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Personal author(s): Cohn PF. Silent myocardial ischemia and infarction. 3rd ed. New York: Marcel Dekker; 1993.

Editor (s), compiler(s) as author: Norman IJ, Redfern SJ, editors. *Mental health care for elderly people*. New York: Churchill Livingstone; 1996.

Conference paper: Bengissson S, Sothemin BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. *MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics*; 1992 Sept 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. P. 1561-5.

Scientific or technical report: Smith P, Golladay K. Payment for durable medical equipment billed during skilled nursing facility stays. Final report. Dallas (TX) Dept. of Health and Human Services (US). Office of Evaluation and Inspections: 1994 Oct. Report No: HHSIGOE 169200860.

Dissertation: Kaplan SI. Post-hospital home health care: the elderly access and utilization (dissertation). St. Louis (MO): Washington Univ. 1995.

Article in electronic format: Morse SS. Factors in the emergence of infectious diseases. *Emerg Infect Dis* (serial online) 1995 Jan-Mar (cited 1996 June 5): 1(1): (24 screens). Available from: [http:// www.cdc.gov/ncidod/EID/cid.htm](http://www.cdc.gov/ncidod/EID/cid.htm).

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Tables should be included in the main document and should be presented after the reference list. Tables should be numbered consecutively in the order they are referred to within the main text. A descriptive title should be provided for all tables and the titles should be placed above the tables. Abbreviations used in the tables should be defined below the tables by footnotes (even if they are defined within the main text). Tables should be created using the "insert table" command of the word processing software and they should be arranged clearly to provide an easy reading. Data presented in the tables should not be a repetition of the data presented within the main text but should be supporting the main text.

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Figures, graphics and photographs should be submitted as separate files (in TIFF or JPEG format) through the submission system. The files should not be embedded in a Word document or the main document. When there are figure subunits, the subunits should not be merged to form a single image. Each subunit should be submitted separately through the submission system. Images should not be labelled (a, b, c, etc.) to indicate fig-

ure subunits. Thick and thin arrows, arrowheads, stars, asterisks and similar marks can be used on the images to support figure legends. Like the rest of the submission, the figures too should be blind. Any information within the images that may indicate an individual or institution should be blinded. The minimum resolution of each submitted figure should be 300DPI. To prevent delays in the evaluation process all submitted figures should be clear in resolution and large in size (minimum dimensions 100x100 mm)

Figure legends should be listed at the end of the main document.

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Editorial



Dear Colleagues,

We are very proud to present you the second issue of the Cyprus Journal of Medical Sciences, the official publication organ of Cyprus Turkish Medical Association.

First of all, I would like to thank the authors and our reviewers very much, for their great support. Following the first issue we have received many positive and some negative comments about our journal. As we stated before, the Cyprus Journal of Medical Sciences aims to publish manuscripts at the highest clinical and scientific level on all fields of medicine and publication processes of the journal are shaped in accordance with the guidelines of the international organizations such as the International Council of Medical

Journal Editors (ICMJE), the World Association of Medical Editors (WAME), the Council of Science Editors (CSE), the Committee on Publication Ethics (COPE), the European Association of Science Editors (EASE).

We look forward to see the Cyprus Journal of Medical Sciences covered in most of the major indexing services within the first year of publication. Again our aim for the near future is to have the journal indexed in both PubMed and Web of Science so the visibility of our content can be amplified with the help of these platforms. We can only manage this with your help.

We condemned all the terrorist attacks and wars, killing many innocent people all over the world and specially in Turkey and Syria. We are also sorry for those people dying in all kinds of disasters. We think and hope peace will win and fear will lose very soon.

Sincerely,

Dr. Sonuç Büyük

Editor

Vice President of Cyprus Turkish Medical Association

Characteristics of Urinary Tract Infections in Patients with Spinal Cord Injuries Hospitalized at a Rehabilitation Centre

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BACKGROUND

The aims of this study were to determine the prevalence of urinary tract infections (UTIs), identify the most frequently isolated pathogens associated with UTIs, and evaluate the antimicrobial susceptibility of these pathogens in spinal cord injury (SCI) patients.

MATERIAL and METHODS

A total of 91 patient charts were retrospectively evaluated in this study. The demographic data of these patients, length of hospital stay, SCI data, mode of bladder emptying, number of UTI episodes, microorganisms isolated by urine culture, and antimicrobial susceptibility tests were recorded.

RESULTS

Of the 91 SCI patients, 53 were males and 38 were females, with a mean age of 45.29 (± 17.87) years. A total of 47 UTI episodes were recorded in 38 SCI patients, nine of whom had experienced two episodes. The prevalence of UTI was 41.7% (38/91). The most frequently isolated pathogen was *Escherichia coli* (57.4%). The antimicrobial agents were most frequently susceptible were gentamicin (72.3%), piperacillin/tazobactam (57.4%), and meropenem (48.9%).

CONCLUSION

The UTI prevalence in patients with SCI was considerably high. *E. coli* was the most common uropathogen, and gentamicin was the most frequently used antimicrobial agent.

Keywords: Spinal cord injury, urinary tract infection, epidemiology

INTRODUCTION

The risk of urinary tract infections (UTIs) is higher in patients with a spinal cord injury (SCI) because of a lack of normal physiological urination resulting from neurogenic bladder in most patients. UTIs are considerably more frequent because of urinary catheter use, residual urine in the bladder due to incomplete emptying, renal stones, obstructed urinary outflow, dysregulation of the autonomic nervous system, and an unbalanced bladder evacuation. These are significant causes of morbidity and mortality (1, 2). Although UTIs occur in 22% of patients with acute SCI in the first 50 days, the UTI prevalence is approximately 20% in patients with chronic SCI (3). UTIs were detected in 60% of SCI patients in a rehabilitation center study in Thailand (4). A mortality rate of nearly 34% is reported in patients with SCI due to urinary sepsis, and this is the second most frequent cause of death in patients with SCI (5, 6).

Pannek and Nehiba (7) found that the incidence of UTIs was 9.7% in SCI patients after urodynamic studies. Because the UTI risk is high after invasive interventions of the urinary system, as with urodynamic assessments, prophylactic antimicrobial treatments are recommended by the American Urological Association and the European Association of Urology. Specifically, these recommendations are for patients with risk factors that include old age, low immunity, diabetes mellitus, smoking, poor alimentation, urinary system anatomical abnormalities, external catheter use, presence of bacterial colonization, and a history of recurrent UTIs and long-term hospitalization before urodynamic assessment (8, 9). Prophylactic antibiotic therapy is used if the infection occurs predictably in a certain setting and it is well known to be associated with a specific organism. Prophylactic antibiotic therapy is mandatory before invasive interventions, such as urodynamic assessments, in patients with SCI who already have most of these risk factors to decrease the risk of UTIs (10). Empirical treatment with antimicrobial agents may also be started in patients with clinical findings suggestive of UTIs until the urine culture results are obtained (11). An approach is to use broad-spectrum antimicrobial agents as initial empiric therapy with the intent to cover multiple possible pathogens commonly associated with the spe-

This study was presented at the 25th Physical Medicine and Rehabilitation National Congress, 22-26 April 2015, Antalya, Turkey.

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Received: 24.06.2016
Accepted: 19.08.2016

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cific clinical syndrome. Unfortunately, choosing appropriate prophylactics or empirical antibiotics is difficult. This difficulty is due to the presence of multiple uropathogens and variable antimicrobial sensitivities. In consideration of these difficulties, we aimed to determine the prevalence of UTIs in SCI patients, identify the most frequently isolated pathogens, and evaluate antibiotic sensitivity in patients hospitalized and followed up between 2010 and 2014 at our institution.

MATERIAL and METHODS

Ethics committee approval for this study was obtained from the local ethics committee. We retrospectively evaluated the charts of 91 patients. The sample size was determined based on another similar study (11). We evaluated the charts of patients (diagnosed with SCI) who were hospitalized and followed up in the physical medicine and rehabilitation department between January 2010 and September 2014. This study was a retrospective study, so the consent form was not taken. In patients with multiple hospitalizations, the authors selected the most recent admission for evaluation.

The patients' demographic data, presence of systemic diseases, hospitalization length, SCI duration, SCI cause, neurological level of the injury, and the injury classification according to the American Spinal Cord Injury Association Impairment Scale (12) were recorded. We also recorded the presence of complete or incomplete injuries, the SCI type (paraplegia, tetraplegia, cauda equina syndrome, or spina bifida), fecal and urinary incontinence, modes of bladder emptying, number of UTI episodes, isolated microorganisms, antibiotic sensitivity test results, and hemoglobin levels. However, the urinary ultrasonography (USG) and urodynamic evaluation results could not be obtained because of missing data in the charts.

Urine cultures were obtained using the clean-catch technique for patients able to void spontaneously or at the time of catheterization, according to the rehabilitation unit protocol. Urine specimens were sent to the Microbiology Laboratory of Selçuk University Medical School and were inoculated in eosin methylene blue agar (Becton, Dickinson, and Company, Sparks, MD) and blood agar [trypticase soy agar with 5% sheep blood (TSA II)] with inoculation loops calibrated with sterile 1- μ l loops. The plates were incubated overnight at 37°C (\pm 1.5°C). The colonies were then counted and, when concluded to be significant, identified following standard microbiological techniques (13, 14). Significant bacteriuria was considered from the level of 10^5 or more colonies of colony-forming units (CFUs) per cm^3 . Bacterial identification and antimicrobial susceptibility testing was performed with a VITEK 2 (bioMérieux, France) automatized system. *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, and *Staphylococcus aureus* ATCC 29213 were used as quality control strains.

In the present study, UTI was defined as the presence of significant bacteriuria with signs and symptoms of UTI. These signs and symptoms included fever, discomfort, pain in the kidney or bladder, onset of urinary incontinence, increased spasticity of skeletal muscles (especially in lower extremities), sweating, or autonomic dysreflexia. Urine cultures with a bacterial colony count of 10^5 CFUs or higher were considered as significant bacteriuria (15).

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS for Windows, version 16.0; Chicago, IL, USA). Continuous variables, such as age, length of hospital stay, and UTI episodes, were presented as the mean \pm standard deviation (SD). Categorical variables, such as gender, injury level, pathogens, and susceptible antibiotics, were presented as percentages. Data from the UTI and non-UTI groups showing a normal distribution were compared using Student's t-test and those not showing a normal distribution were compared using the Mann-Whitney U test. The chi-square test was used for the comparison of frequencies. The statistical significance level was set at $p < 0.05$.

RESULTS

Of the 91 SCI patients, there were 53 males and 38 females with an overall mean age of 45.29 (\pm 17.87) years (age range 16–75). The average length of hospital stay was 35.95 (\pm 23.52) days. The neurological injury levels included 37% cervical, 47% thoracic, and 16% lumbosacral. There were 12 patients using clean intermittent catheterization (CIC); there were 11 patients (30.6%) with UTI and there was 1 patient (2.6%) without UTI. There were 47 UTI episodes in 38 of the SCI patients; several patients had recurrent UTIs on an admission. There were nine patients with two episodes. The prevalence of UTIs was 41.7% (38/91).

The vast majority of uropathogens were gram-negative bacteria. *E. coli* was the most frequently isolated pathogen (57.4%) followed by *P. aeruginosa* (14.8%) and *Klebsiella pneumoniae* (10.6%). The three most sensitive antibiotics were gentamicin (72.3%), piperacillin/tazobactam (57.4%), and meropenem (48.9%) (Table 1). The antimicrobial susceptibility and resistance status of *E. coli* strains determined after years of hospitalization are shown in Table 2.

All of the patient charts that were evaluated for this study were classified as either patients with UTIs or without UTIs. The patients' characteristics in both groups are shown in Table 3. Statistically significant differences were found between the two groups in terms of length of hospital stay, fecal incontinence, urinary incontinence, and mode of bladder emptying ($p < 0.001$, $p < 0.001$, $p = 0.002$, and $p < 0.001$, respectively).

DISCUSSION

In our assessment of SCI patients, the prevalence of UTIs was 41.7%. *E. coli* was the most common uropathogen, and gentamicin was the most frequently used antimicrobial agent. The length of hospital stay was longer in patients with UTIs. These patients also had higher rates of fecal and urinary incontinence and higher rates of bladder emptying with CIC.

The UTI rate in SCI patients remains high, despite advancements in treatment methods. The prevalence of UTIs was 41.7% in the present study, supporting previously reported results (3, 4). Most frequently, *E. coli*, *P. aeruginosa*, or *K. pneumoniae* are isolated in urine cultures after a UTI develops (11, 16–18). *E. coli* was the most frequently detected uropathogen in our study, followed by *P. aeruginosa* and *K. pneumoniae*, findings that concurs with previous studies (11, 16–18).

In the present study, the three most sensitive antibiotics were gentamicin, piperacillin/tazobactam, and meropenem. Interestingly,

TABLE 1. Uropathogens and their antibiotic susceptibility pattern

Uropathogens	n: 47	Number of sensitive tests/total number of available tests									
		Ampicillin	Ciprofloxacin	Ceftriaxone	Gentamicin	Tazobactam	Piperacillin/ Imipenem	Meropenem	Cefuroxime	Trimethoprim- sulfamethoxazole	Ertapenem
<i>Escherichia coli</i>	27	9/27	10/27	9/27	20/27	15/27	8/27	14/27	11/27	11/27	5/27
<i>Pseudomonas aeruginosa</i>	7	0/7	6/7	0/7	6/7	6/7	3/7	4/7	0/7	0/7	0/7
<i>Klebsiella pneumoniae</i>	5	0/5	4/5	2/5	3/5	4/5	3/5	4/5	2/5	2/5	3/5
<i>Acinetobacter</i>	3	1/3	0/3	0/5	2/3	0/3	1/3	0/3	0/3	0/3	0/3
<i>Staphylococcus epidermidis</i>	2	0/2	0/2	0/2	2/2	0/2	0/2	0/2	0/2	2/2	0/2
<i>Enterobacter cloacae</i>	1	0/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
<i>Proteus mirabilis</i>	1	0/1	0/1	1/1	0/1	1/1	0/1	0/1	0/1	0/1	1/1
<i>Serratia marcescens</i>	1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	1/1
Total sensitivity (%)*		21.28	44.6	27.6	72.3	57.4	34	48.9	29.7	34	23.4

* total sensitivity was calculated by the number of sensitive organisms/total organisms (47)

TABLE 2. Changing susceptibility and resistance status of *Escherichia coli* strains against antibiotics during the years of hospitalization

	2010 (n: 4) d/d'	2011 (n: 5) d/d'	2012 (n: 4) d/d'	2013 (n: 7) d/d'	2014 (n: 7) d/d'
Ampicillin	2/1	2/5	0/5	0/4	4/1
Ciprofloxacin	0/0	3/1	3/1	2/2	1/2
Ceftriaxone	3/0	2/1	1/1	2/1	0/0
Gentamicin	3/0	3/1	3/2	4/0	5/0
Piperacillin/Tazobactam	3/0	3/1	4/0	3/1	0/0
Imipenem	0/0	3/0	2/0	1/0	0/0
Meropenem	3/0	4/0	3/0	2/0	0/0
Cefuroxime	0/0	3/1	3/2	1/2	3/0
Trimethoprim- sulfamethoxazole	3/0	3/1	1/4	1/2	1/1
Ertapenem	0/0	0/0	2/0	2/0	0/0

d: susceptible; d': resistant

only 27.6% and 44.6% of the detected pathogens were susceptible to ceftriaxone and ciprofloxacin, respectively. However, these antibiotics are frequently used in the prophylaxis against UTIs and in their empirical treatment (4). This was consistent with other studies, which revealed that the prevalence of antimicrobial resistance in uropathogens is increasing worldwide (17, 18). Because the incidence of UTI in SCI patients is very high, there is a very high chance of transmission of multi-drug resistant strains among patients (19). When examining the antimicrobial susceptibility of *E. coli* strains in this study, there was no resistance against imipenem, meropenem, or ertapenem between 2010 and 2014; however, resistance against ampicillin and trimethoprim-sulfamethoxazole was detected in some, but not all, strains. SCI patients with symptomatic UTI should be treated with the most specific, narrowest spectrum antibiotics available for the shortest possible time (19). On the other hand, most strains were susceptible against gentamicin and piperacillin/tazobactam. According to this data, a preference for carbapenem, gentamicin, or piperacillin/tazobactam in the empirical or prophylactic antimicrobial treatment of UTIs may provide better treatment success.

Hand hygiene and staff and patient education are recognized as important aspects of care in the prevention of UTI in patients with SCI (20). Waites et al. (16) reported the absence of an association between the risk of UTIs and gender, type of injury etiology, urinary stones, co-morbidities, surgery, and previous antimicrobial treatments. Based on comparing patient groups with and without UTIs in the present study, the length of the hospital stay was longer in those patients with UTIs; furthermore, in the UTI group, the frequency of fecal and urinary incontinence was higher and there was a greater presence of bladder emptying by CIC. Unfortunately, it is difficult to determine whether the cause of the increased hospital stay was due to the presence of UTIs or the length of hospital stay were a risk factor for UTI development. However, both conditions increase the risk of nosocomial infections, which increase costs and morbidity and mortality rates (21). Therefore, the length of hospital stay of hospitalized patients, especially SCI patients, should be as short as possible.

One of the reasons *E. coli* is the most common uropathogen causing UTIs is because of fecal contamination due to fecal incontinence, which is present in most SCI patients (22). The frequency of fecal incontinence was higher in UTI patients in the present study, which supports previous findings (22).

The mode of bladder emptying in SCI patients is important with respect to the risk of UTI development. Oz et al. (23) found that the rate of bacteriuria was 53.3% in patients using CIC and 82.9% in those with permanent catheters in their study of 63 SCI patients. Also, the UTI frequency was higher in patients using CIC than in those with normal voiding in another study (17). In the present study, the frequency of permanent catheterization was nearly equal in patients with and without UTIs. However, CIC was more frequently used by those with UTIs, whereas spontaneous micturition was more frequent in the group without UTIs. According to these results, it seems that spontaneous voiding carries the least risk of UTIs. On the other hand, in the presence of vesico-urethral reflux, CIC is a safer and healthier mode of bladder emptying because it causes less residual urine and enables a regular and rhythmic bladder emptying mode (24, 25).

The present study has some limitations. The first limitation is that because it is a retrospective study, urinary ultrasonogra-

TABLE 3. Comparison of variables of the patients with and without UTI (n:91)

Variables	UTI (n: 38)	No UTI (n: 53)	p value
Age (years), mean (SD)	44.63 (17.63)	45.77 (18.19)	0.766
Male gender, n (%)	18 (47.4%)	35 (66%)	0.075
Systemic disease, n (%)			
Diabetes mellitus	7 (18.9%)	4 (7.5%)	0.183
Hypertension	1 (2.7%)	3 (5.7%)	
Length of hospital stay (days), mean (SD)	49.86 (16.56)	25.98 (22.79)	<0.001*
Duration of SCI (months), mean (SD)	16.24 (30.26)	31.34 (55.55)	0.132
Cause of SCI, n (%)			
Traffic accident	5 (13.2%)	8 (15.4%)	
Occupational accident	3 (7.9%)	3 (5.8%)	
Falling	14 (36.8%)	10 (19.2%)	
Fire arm wounds	0	2 (3.8%)	0.391
Cuts	0	1 (1.9%)	
Tumor	3 (7.9%)	2 (3.8%)	
Postoperative	4 (10.5%)	6 (11.5%)	
Infection	0	3 (5.8%)	
Others	9 (23.7%)	18 (32.8%)	
Neurological level, n (%)			
Cervical	11 (28.9%)	25 (46.1%)	0.245
Thoracic	24 (63.2%)	19 (35.5%)	
Lumbar	3 (7.9%)	10 (18.4%)	
ASIA classification**n (%)			
A	12 (40%)	9 (26.5%)	
B	1 (3.3%)	1 (2.9%)	0.180
C	10 (33.3%)	7 (20.6%)	
D	7 (23.3%)	17 (50%)	
E			
Complete SCI, n (%)	14 (37.8%)	13 (25.5%)	0.215
Type of SCI, n (%)			
Paraplegia	12 (31.6%)	20 (37.8%)	
Tetraplegia	24 (63.2%)	30 (56.6%)	0.901
Cauda equina syndrome	1 (2.6%)	2 (3.8%)	
Spina bifida	1 (2.6%)	1 (1.8%)	
Presence of fecal incontinence**n (%)	33 (86.8%)	21 (50%)	<0.001*
Presence of urinary incontinence**n (%)	35 (92.1%)	26 (61.9%)	0.002*
Mode of bladder emptying**n (%)			
Spontaneous micturition	5 (13.9%)	20 (52.6%)	<0.001*
Permanent urinary catheter	20 (55.6%)	17 (44.7%)	
CIC	11 (30.6%)	1 (2.6%)	
Hemoglobin level (g/dl), mean (SD)	12.64 (1.17)	12.74 (1.97)	0.788

UTI: urinary tract infection; SD: standard deviation; SCI: spinal cord injury;
 ASIA: American Spinal Cord Injury Association; CIC: clean intermittent catheterization
 *Statistical significant at p value <0.05; ** There was missing data

phy examinations and urodynamic studies could not be found in some patient charts, which is a cause of missing data. The second limitation is the limited number of patients, although all patients from the past 4 years were reviewed. Therefore, a generalization from the results is not feasible, and the possible risk factors associated with UTIs could not be evaluated because of the insufficient sample size. Thus, there is a need to conduct further prospective studies that include a larger number of patients.

In conclusion, the UTI prevalence in SCI patients was considerably high. Close urological follow-up is crucial in ensuring that adequate bladder drainage is achieved, avoiding the use of long-term indwelling urinary catheters, if at all possible. The modes of bladder emptying, including spontaneous micturition and the use of permanent urinary catheter or CIC, are decided by the clinical characteristics of SCI patients. Gram-negative bacteria, especially *E. coli*, were the most frequently isolated uropathogen, and carbapenem, gentamicin, and piperacillin/tazobactam were the most frequently used antimicrobial agents. Resistance against antibiotics shows a continual increase. Therefore, the length of hospitalization should be shortened to decrease the risk of UTIs. Finally, when a UTI is detected, an antimicrobial agent with the narrowest susceptibility spectrum should be chosen and used for as short a time as possible.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Selçuk University School of Medicine.

Informed Consent: Informed consent was not received due to the retrospective nature of the study.

Peer-review: Externally peer-reviewed.

Author contributions: Concept - İ.A., A.Ç., H.T.D.; Design - İ.A., A.Ç.; Supervision - F.L., Ö.M.Ö.; Resource - İ.A., A.Ç., H.T.D.; Materials - A.Ç., H.T.D.; Data Collection and/or Processing - İ.A., A.Ç.; Analysis and/or Interpretation - İ.A.; Literature Search - İ.A.; Writing - İ.A., H.T.D., F.L.; Critical Reviews - F.L., Ö.M.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Evaluation of Epidemiological and Clinical Properties of Kawasaki Disease: A Single Center Experience

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BACKGROUND

Kawasaki disease (KD) is a self-limiting vasculitis with unknown etiology. The most feared complication is coronary artery aneurysm. This study aimed to evaluate the epidemiological, laboratory, and clinical properties of Turkish patients with Kawasaki disease.

MATERIAL and METHODS

This retrospective study included the patients with KD who were diagnosed according to the American Heart Association guidelines. The demographic, clinical, and laboratory results of patients were obtained from the recordings.

RESULTS

The study included 72 patients with KD. The male/female ratio was 1.4. The mean age of diagnose was 35±26 months. The most frequent clinical finding was oropharyngeal inflammatory changes (n=64, 89%), and the most rare clinical finding was desquamation in the distal parts of the extremities (n=44, 61%). Coronary artery involvement was detected in 33 (46%) patients, which was higher than the other Asian countries but similar to other studies conducted in Turkey. The most frequently affected vessel was the left coronary artery (n=26, 79%). Coronary artery involvement was higher in males than in females (p<0.05). The clinical type was incomplete KD in 26 (36%) patients. During the study period, the number of the patients per year increased with every passing year. Throughout the study duration of 14 years, the number of newly diagnosed incomplete KD patients increased year by year, (17 patients (65%) were diagnosed in the last 5 years).

CONCLUSION

The number of patients diagnosed with typical and incomplete KD has been increasing in recent years. Clinicians' awareness regarding KD may be the reason of this increment. Coronary artery disturbances are frequently observed in Turkish population.

Keywords: Kawasaki disease, incomplete Kawasaki disease, coronary artery, vasculitis, Turkey

INTRODUCTION

Kawasaki disease (KD) is a self-limiting vasculitis during the early childhood period and is characterized by fever, nonexudative conjunctivitis, inflammatory changes of oral mucosa, usually unilateral cervical lymphadenopathy and enduration, erythema and desquamation in the distal parts of extremities, and diffuse polymorphic rash. KD was first defined by Tomisaku Kawasaki from Japan in 1967. It is widely observed worldwide but frequent in Asians, particularly in Japanese (1, 2).

KD is usually observed between the ages of 6 months and 5 years, and it is the most frequent cause of acquired heart diseases in developed countries (3). Without treatment, coronary artery aneurysms are observed in 15%–25% of patients and can be the reason for thrombosis, myocardial infarction, and sudden death. Coronary aneurysms can be prevented five-fold by intravenous immunoglobulin (IVIG) therapy (1, 4).

Epidemiological and clinical studies suggest that KD is caused by an infectious agent in children with a genetic predisposition. However, the responsible agent remains to be determined (1, 5-7). Thus, epidemiological studies have become very important to detect ethnic and regional differences. Although KD is not a very common disease in other Asian countries, it is the second most common vasculitis observed in the pediatric age group in Turkey (8). Studies from Turkey reported much more coronary artery disturbance incidences (25%–45%) (9-15) than those from Japan. In the study of Gulhan et al. (9), the coronary artery involvement was reported earlier and more frequent than other Asian countries. The desquamation of extremities was also reported during the early stages of KD in the Turkish population. This high percentage of coronary artery involvement in Turkish patients could be because of the difference in the causative agents or genetic phenotype.

KD is an important reason for cardiac morbidities that can be prevented or decreased by early and appropriate treatment. There are differences in the course and severity of KD because of ethnic and regional differences. Therefore, it

This study was presented at the 15th National Pediatric Cardiology and Cardiovascular Surgery Congress, 13-16 April 2016, Antalya, Turkey.

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Received: 20.07.2016
Accepted: 30.08.2016

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is important for all countries to define the clinical and epidemiological properties of their patients with KD. Hence, this retrospective study aimed to demonstrate the epidemiological and clinical properties of patients with KD in the pediatric cardiology department of Ege University Hospital which is a tertiary referral center of the west part of Turkey.

MATERIAL and METHODS

This retrospective study included patients who were diagnosed and treated as KD and who were followed up between September 1999 and March 2013 in the pediatric cardiology department of our university hospital, which is a tertiary center in the west part of Turkey. The study was approved by the Ethics Committee of the University. Informed consents of the parents were obtained during their follow-up visits.

Patients diagnosed with KD according to the clinical criteria defined by the American Heart Association (AHA) (1). Patients having fever for >5 days and having four of five clinical conditions, i.e., oropharyngeal changes, edema or hyperemia of extremities, cervical lymphadenopathy, bilateral nonexudative conjunctivitis, and skin eruptions, were defined as typical KD. Patients who had <4 of these clinical situations with coronary artery disturbances or three of the supportive laboratory findings, including hypoalbuminemia, pyuria, thrombocytosis, anemia, and high transaminase levels, were defined as incomplete KD (IKD).

Patients' demographic properties, such as age at presentation, sex, and season at diagnosis, were obtained from records. Furthermore, details regarding drugs used for treatment and the response to the treatment were collected.

Echocardiography

For echocardiographic evaluation, the GE Vingmed Vivid Pro 7 (GE Vingmed Ultrasound, Horten, Norway) echocardiography device was used. Coronary artery involvement was defined as positive if one of the following three conditions was detected: 1- Dilatation defined as internal lumen diameter was >+2z scores according to AHA, 2- Aneurysm defined according to the Japanese Ministry of Health criteria (localized saccular or fusiform dilatations of coronary arteries with internal diameter >3 mm in children aged <5 years and >4 mm in children aged ≥5 years, or internal diameter of a segment measured ≥1.5 times that of an adjacent segment), 3- Ectasia defined as an increase in the brightness of the vessel wall and lack of tapering with or without a decrease in the left ventricular ejection fraction, mitral regurgitation, or pericardial effusion (1).

Statistical Analysis

The Statistical Package for Social Sciences (SPSS Inc.; Windows, Version 18.0, Chicago, USA) package program was used for statistical analyses. Descriptive statistics were presented as percentages, means, standard deviations, and frequency tables. Qualitative data were reported as frequencies with percentages, while quantitative data were reported as means with standard deviations.

RESULTS

The study included 72 patients with KD, of which 42 (58%) were males. The male/female ratio was 1.4 ($p < 0.05$). The youngest pa-

tient was 4 months old, whereas the oldest one was 11 years old. The mean age of diagnosis was 35 ± 26 months. The seasons at the diagnosis were as follows: 27 (38%) winter, 19 (26%) spring, 10 (14%) summer, and 16 (22%) autumn (Table I).

Clinical Findings

Duration of fever till the diagnosis was 9.4 ± 6.4 days. As shown in the Table I, oropharynx was affected in 64 (89%) patients, whereas maculopapular rash, conjunctivitis, cervical lymphadenopathy and enlargement, hyperemia, or desquamation in the distal parts of the extremities were observed in 59 (82%), 52 (82%), 48 (67%), 47 (65%), or 44 (61%) patients, respectively. The most frequent clinical finding was the involvement of oropharynx, whereas the rarest one was changes in extremities such as desquamation.

The clinical type was IKD in 26 (36%) patients. During the study period, the number of new KD patients increased with every passing year. Throughout the study duration of 14 years, the number of newly diagnosed incomplete Kawasaki disease patients increased year by year, (17 patients (65%) were diagnosed in the last 5 years) as shown in Figure 1.

Laboratory Results

In the acute phase of KD, white blood cell (WBC) count was $>15000/\text{mm}^3$ in 32 (44%) patients. The mean WBC count was $15619 \pm 5904/\text{mm}^3$. The thrombocyte count was $>450000/\text{mm}^3$ in 53 (74%) patients at the first week of the disease, and the mean thrombocyte count at the second week of the disease was $539.485 \pm 229.567/\text{mm}^3$. Erythrocyte sedimentation rate (ESR) was

TABLE I. The epidemiological and clinical properties of patients with Kawasaki disease

Patients with Kawasaki disease, n (%)	72 (100)
Gender, n (%)	
Female	30 (42)
Male	42 (58)
Age at diagnosis (mean±SD, months)	35±26
Season of diagnosis, n (%)	
Winter	27 (38)
Spring	19 (26)
Summer	10 (14)
Autumn	16 (22)
Mean duration of fever (days)	9.4±6.4
Clinical findings in the acute and subacute phase, n (%)	
Oropharyngeal changes	64 (89)
Rash	59 (82)
Conjunctivitis	48 (67)
Lymphadenopathy	47 (65)
Desquamation	44 (61)
Clinical type, n (%)	
Typical	46
Incomplete	26
n: number; SD: Standard deviation	

high (>40 mm/h) in 58 (80%) patients, and the mean ESR value was 83.8 ± 30.5 mm/h. C-reactive protein (CRP) levels were high (>5 mg/dL) in 59 (82%) patients, and the mean CRP level was 10.3 ± 7.4 mg/dL. The mean hemoglobin level was 10.4 ± 1.1 mg/dL.

Cardiovascular Complications

Coronary artery involvement was observed in 33 (46%) patients. The most frequently affected vessel was left main coronary artery (n=26, 79%). Right coronary artery involvement was solely observed in one patient, while others had both the right and left coronary artery involvement (Figure 2). Coronary artery involvement was detected as dilatation in 19 (58%), vessel ectasia in nine (27%), and aneurysm in five (15%) of the 33 patients (Table 2).

Kawasaki disease and coronary artery involvement were higher in males than in females ($p < 0.05$). Patients with coronary artery lesions were both males (n=22, 67%) and females (n=11, 33%), whereas patients without coronary artery lesions were usually females (n=22, 56%).

Treatment and Follow-up

All patients were received 2-g/kg single dose IVIG and 80 mg/kg acetyl salicylic acid (ASA). Eight (11%) patients whose fever could not be controlled received second dose of IVIG, one of them also needed steroid after the second dose of IVIG. Only

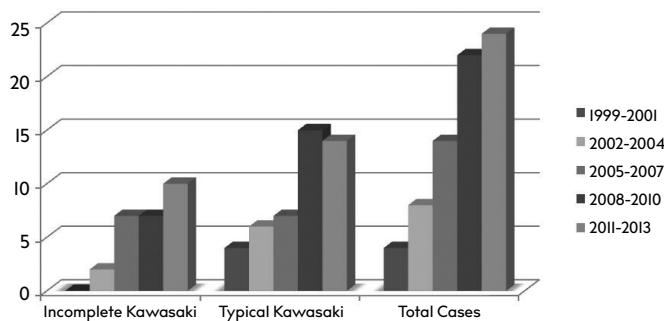


FIGURE 1. Distribution of new patients according to years of diagnosis

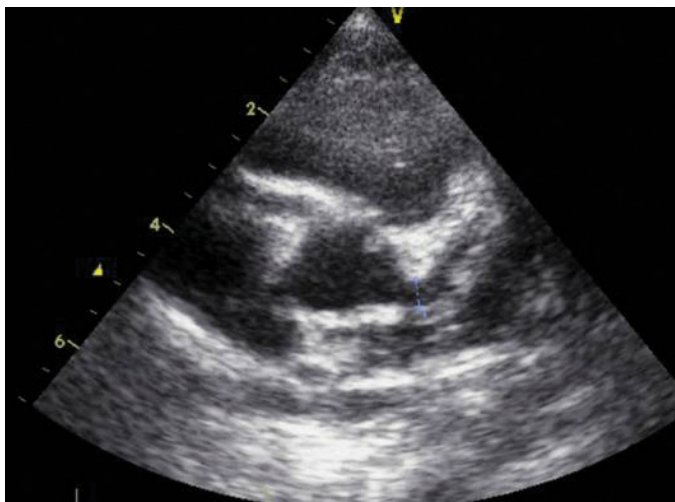


FIGURE 2. Echocardiographic demonstration of the right and left coronary artery dilatation because of Kawasaki disease

one patient received dipyridamole with ASA because of a large aneurysm (8 mm). During the follow-up period, the sizes of the coronary arteries were reversed in 21 (64%) patients. In 11 (33%) patients, the arteries decreased in diameter, but the z scores were still >+2. Only the size of the coronary artery of the patient who received steroid did not change. There were no visible aneurysms on echocardiography in all patients (Table 2).

DISCUSSION

Kawasaki disease, which is an acute and self-limiting vasculitis during childhood, has become the most important cause of acquired cardiac diseases, particularly in developed countries such as USA and Japan (1, 3). The most feared complication of KD is coronary artery involvement, particularly aneurysms. In our study, the amount of coronary artery involvement was higher than that expected and the number of new KD patients has been increasing in recent years.

Coronary artery involvement was usually reported in up to 25% of diseases in the literature (1, 16-18). In our study, coronary artery disturbances were detected in 46% of patients. When compared with other Asian countries, these high rates were also reported by other studies from Turkey. Coronary artery involvement in Turkish patients with KD is usually reported to be 26%–44% (9-15). This high percentage of coronary artery involvement observed in Turkish patients could be because of the differences in causative agents or genetic variability. KD is more frequently observed in siblings of patients with KD, and genetic factors are considered to have an effect on the occurrence of the disease (1). Therefore, some genetic studies were performed to reveal the genetic predisposition of patients. Tsukahara et al. (19) demonstrated that methylenetetrahydrofolate reductase gene polymorphism has an effect on the development of a coronary artery aneurysm. Onouchi et al. (20) reported that the frequen-

TABLE 2. Distribution of coronary artery lesions at the acute phase, drugs for treatment, and the response to the treatment

Patients with Kawasaki disease, n (%)	72 (100)
Coronary artery involvement, n (%)	
Absent	39 (54)
Present	33 (46)
Dilatation	19 (58)
Ectasia	9 (27)
Aneurysm	5 (15)
Treatment n (%)	
Single dose IVIG+ASA	63 (88)
2 dose IVIG+ASA	7 (10)
2 dose IVIG+single dose steroid+ASA	1 (1)
2 dose IVIG+ASA+Dipyridamol	1 (1)
Coronary artery morbidities, n (%)	
Coronary artery diameter returned to normal z scores	21 (64)
Coronary artery diameter decreased (but still z score >+2)	11 (33)
Dimension of aneurysm not changed	1 (3)
Coronary artery diameter increased or new aneurysm occurred	0 (0)

n: number; IVIG: intravenous immunoglobulin; ASA: acetylsalicylic acid

cy of the allele of rs3741596 in ORAI1 gene is >20 times higher in Japanese compared with Europeans and alterations have an association with KD. For this reason, more studies are required to explain the probable genetic predisposition in different ethnicities.

Epidemiological studies for KD demonstrate that the KD diagnosis have a seasonal choice and is usually observed during the winter and spring (1). In our study, most patients (64%) were diagnosed in winter and spring, similar to the results of literature worldwide and also those from Turkey (1, 5-7, 9, 15). Viral infections are mostly observed during the winter and spring; therefore, this result of the study supports the idea of an infectious agent in the pathogenesis of KD (5).

The male gender has a tendency for KD and also coronary artery complications (6, 7, 16-18). Similar to previous studies, the male/female ratio was significantly high, particularly in patients with coronary artery involvement, in our study.

Kawasaki disease usually affects small children and its incidence is particularly high between ages of 1 and 2 years. Eighty percent of patients are younger than 4 years, and 50% are younger than 2 years. Patients older than 8 years and younger than 3 months are very rarely observed (16-18). In our study, 85% of patients were diagnosed with KD between ages 1 and 5 years, and the mean age of diagnosis was 35±26 months. The youngest patient was 4 months, whereas the oldest one was 11 years.

When a patient does not have all of the expected clinical findings, KD is defined as IKD (1, 16-18, 21). This condition is mostly observed in very young and very old children. But the laboratory findings resemble the typical ones (6, 7, 22). According to the clinical and laboratory findings, 26 (36%) patients were evaluated as IKD, of which 16 (61%) were younger than 5 months and older than 5 years. These results were similar to those of the literature (21, 22). Jakob et al. (23) study with 315 patients with KD in Germany demonstrated that IKD patients were 1.2-2 years younger than typical KD ones, with the ratio of IKD patients reported to be 20%. A study from Pakistan reported that the ratio of IKD patients was 18%. However, studies from Turkey reported higher rates of IKD up to 42% like the results of our study (11-13). This result can also be explained by the regional variations of etiological agents or genetic susceptibilities.

Our study demonstrated that with every passing year, the number of new patients with KD and also the IKD forms increased. This result could be due to the increase of the exposure to the etiological agents or most probably increase in the awareness of the clinicians about the disease. In particular, high numbers of IKD forms in the recent years are the signs of an increased awareness of clinicians. However, new studies for identifying the etiology of KD still have a high importance for explanation of this increase in the incidence.

The most frequent clinical finding is the mucocutaneous changes that are observed in >90% of patients with KD (6, 7, 16-18). Similar to the literature, we found that inflammatory changes in the oropharynx of 64 (89%) patients were the most common clinical sign. The rates of other findings were as follows: cuta-

neous maculopapular rash (82%), conjunctivitis (65%), and desquamation of extremities (61%).

Furusuo et al. (24) had used IVIG for the first time in 1984 for treating KD. The incidence of coronary artery involvement without a treatment is 15%–25%, whereas the incidence decreases to 3%–5% with IVIG (6, 7). The mean duration of fever in our study was 9.52±5.47 days, which denoted the delay in the therapy. But according to the knowledge that the effectivity of a treatment in the first 10 days is high, it was considered that the treatment of patients remained effective. Moreover, the follow-up results of the patients in our study demonstrated that 21 of the coronary lesions returned to normal and 11 dilatations decreased in diameter. In other words, the total or partial response rate to the treatment was 96%. There were no visible aneurysms on echocardiography of all patients.

CONCLUSION

In conclusion, the number of patients diagnosed as typical KD and IKD has been increased in recent years. Clinicians' awareness regarding KD may be the reason of this increment. Coronary artery disturbances are frequently observed in the Turkish population, and genetic predisposition may be a reason for it.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Ege University Ethics Committee.

Informed Consent: Written informed consent was obtained from patient who participated in this study.

Peer-review: Externally peer-reviewed.

Author contributions: Concept - S.B., A.O.; Design - S.B., Z.U., E.L.; Supervision - S.B., A.O., Z.U.; Resource; Materials; Data Collection and/or Processing - S.B., Z.U., E.L.; Analysis and/or Interpretation - S.B., Z.U., E.L., A.O.; Literature Search - S.B., Z.U., E.L.; Writing - S.B., A.O.; Critical Reviews - S.B., Z.U., E.L., A.O.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Isolated Jejunal Angiodysplasia: A Rare Cause of Massive Lower Gastrointestinal Bleeding Requiring Surgical Resection with an Unexpected Localization

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Angiodysplasias are most commonly observed in the cecum and ascending colon. The number of cases with angiodysplasias in the jejunum is very few. The endovascular transcatheter embolization method can be used in cases of lower gastrointestinal tract bleeding when endoscopy is not effective. According to the nature of lesion and source of bleeding, embolization is performed using the appropriate embolic agent. A surgical approach is used when endoscopic treatment methods and mesenteric angiography attempts fail. Here we present a rare case of jejunal angiodysplasia with massive lower gastrointestinal bleeding treated with selective arterial embolization followed by urgent surgery because of a failed attempt to gain hemodynamic stability using both conservative and endoscopic methods.

Keywords: Lower gastrointestinal bleeding, angiodysplasia, jejunum

INTRODUCTION

Gastrointestinal (GI) tract bleeding is associated with a group of diseases that have high mortality rates and for which it is difficult to make diagnosis and differential diagnosis. The most common causes of lower GI bleeding in adults older than 60 years of age are vascular ectasias (angiodysplasias) and diverticulosis (1). Here we present a case of isolated jejunal angiodysplasia treated with selective arterial embolization followed by urgent surgery.

CASE PRESENTATION

A 70-year-old female patient with fatigue and anal bleeding was admitted to the gastroenterology clinic. Hematochezia was detected on rectal examination. The patient's hemoglobin level on admission was 7.3 g/dL. The hemoglobin level continued to drop as a result of bleeding. The active source of bleeding was not detected on endoscopy and colonoscopy. Extravasation located at the segment about 50–60 cm away from Treitz ligament was observed by IV contrast tomography screening. The decision to perform angiography was made because no clear focus of bleeding was detected by endoscopic examination. Superselective embolization was performed by placing embolic agents (coils) in the feeding artery (branch of the superior mesenteric artery) of the bleeding bowel segment accompanied by angiography screening at the interventional radiology department (Figure 1). She was administered 6 units of erythrocyte suspension within 24 h prior to the urgent surgery. An urgent surgical approach was considered because of deterioration of the general condition and a decrease in the hemoglobin level of the patient. Approximately 60 h passed between admission to the gastroenterology clinic and the surgery. With the guidance of jejunal segment, where the coil was preoperatively placed, jejunotomy was performed approximately 30 cm away from Treitz ligament, targeting the segment observed on tomography. Many hemorrhagic foci were observed in the mucosal surfaces of the jejunotomy region and were considered to be angiodysplasias. The ends of these lesions were resected, both in the proximal and distal segments (Figure 2). In total, a 40-cm-long jejunal segment was resected beginning from 25 cm to 65 cm of the jejunum, and end-to-end anastomosis was performed. No other gross pathology observed in the ongoing exploration. The patient was discharged with full recovery after 7 days of hospitalization as no

This study was presented at the 20th National Surgical Congress, 13-17 April 2016, Antalya, Turkey

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Received: 23.04.2016
Accepted: 20.07.2016

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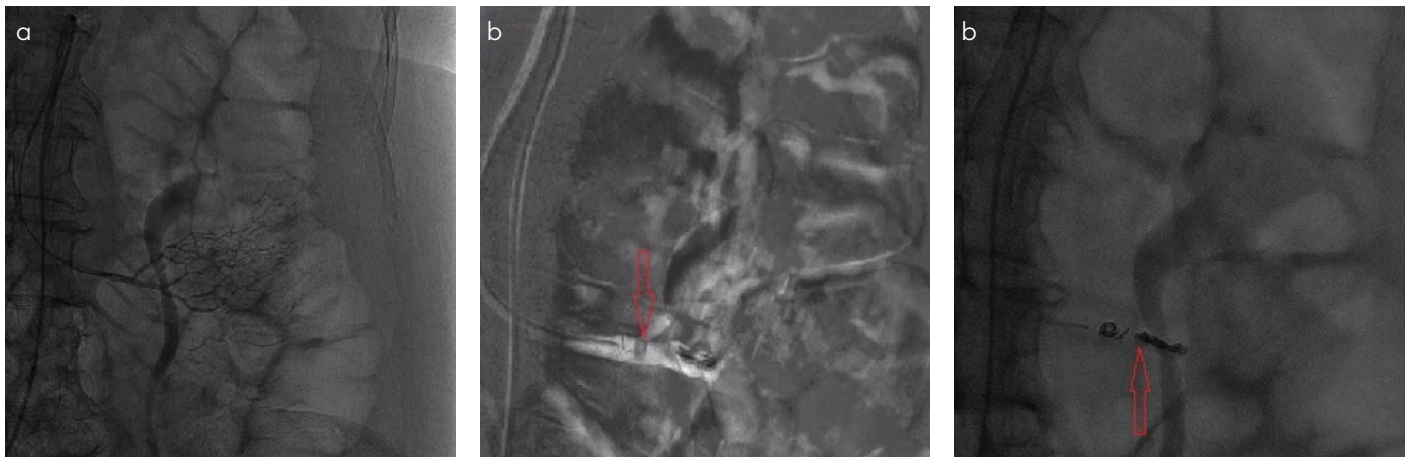


FIGURE 1. a-c. Images during angiography (a-c), embolization coils - red arrows (b, c).



FIGURE 2. Hemorrhagic foci at the mucosa of the resected jejunal segment

problems or complications were observed. Follow-ups over 3 months after the surgery were uneventful. The postoperative pathological examination of the resected material indicated angiodysplasia (Figure 3). Informed consent was obtained from patient who participated in this case.

DISCUSSION

Angiodysplasias are the most common vascular abnormalities of the GI tract and are caused by intestinal submucosal vein dilatations. They are often observed in the cecum and ascending colon but are unlikely to occur in the jejunum (1). Endoscopic methods for treating lower GI bleedings are the most commonly used and have been found to have steadily increasing success rates in recent years. Angiography, technetium-99m-labeled erythrocyte scintigraphy, and small bowel screening should be performed when bleeding, which cannot be diagnosed by colonoscopy alone, is suspected (2). Selective superior mesenteric artery (SMA) angiography can show all parts of the small bowel and right colon (3).

Since the advent of capsule endoscopy, a noninvasive, safe, and well-tolerated technique, in 2001 it has become possible to directly visualize the small intestine. The diagnostic accuracy of capsule endoscopy (CE) for GI system bleeding of unknown etiology (GSBUE) has been found to range between 41% and 92% in several studies. Pennazio et al. (4) performed CE in 100 patients with GSBUE and found the diagnostic accuracy to be 92.3%.

Embolization treatment is associated with up to 20% risk of intestinal infarcts; thus, distal embolization should be performed as much as possible using temporary blocking agents and superselective catheterization techniques. Complications depending on the contrast agent, including arterial dissection and occlusion, renal failure, and bowel infarction, and on vasopressin, including myocardial infarction, may develop. Gordon et al. (5) examined 17 patients with angiographically detected bowel or colon bleeding. Of these, 14 patients had superselective catheterization, and embolization was successfully performed in 13 of them without any necessities of additional treatment; further, bowel necrosis was not observed among the patients. In our case, superselective embolization was performed because endoscopic treatment methods are not effective enough, and we failed to obtain the desired success. We think that embolization failed because of the embolization of the minor branches of the major vessel instead of branch of the superior mesenteric artery because of technical problems. No complications related to embolization were detected in our patient. There were no signs of ischemia of the bowels during the intraoperative exploration. To avoid risking the patient's life, surgery was performed immediately without a plan of second embolization because of the active bleeding aftermath of the first embolization, deterioration of general condition of the patient, and concern about re-experiencing the technical problems that occurred during the first embolization. Poultides et al. (6) reported that a waiting period before surgery is unnecessary for the patients with a deteriorating general condition, active bleeding, 6 or more units of blood exchange.

Urgent surgery is essential in 5%–10% of patients with lower GI bleeding, which cannot be treated using nonsurgical methods, require repeated blood transfusions, or are associated with continuous bleeding (7, 8). For an optimal surgical process, the patient should be as stable as possible for the hemodynamics and the bowel part to be resected should be identified previously. Searching the lesion by inspection and palpation during surgery is recommended in patients without a certain source of bleeding, and if the lesion cannot be detected in this manner, it is recommended to detect the source

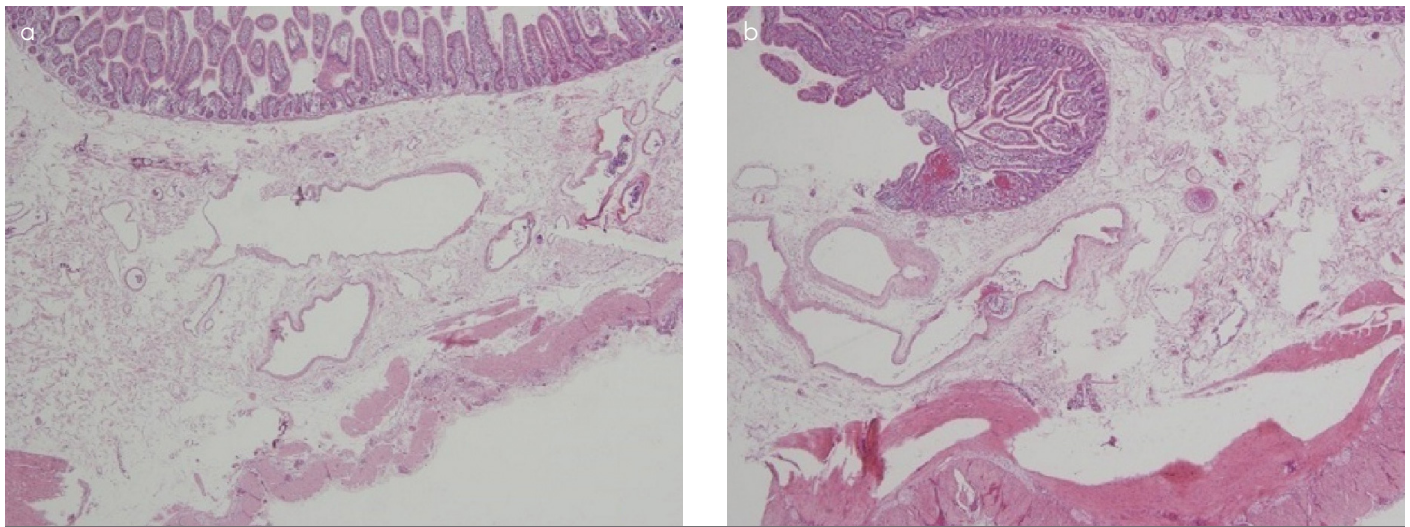


FIGURE 3. a, b. Submucosal, irregularly shaped, dilated, and thin-walled vessels in the jejunal tissue- HE20 (a), HE40 (b)

of bleeding by patting and clamping the bowel segments. Blind resections were associated with re-bleeding rates of 75% and mortality rates as high as 57%. In case of massive bleeding, the source of bleeding can be detected by ileotomies and/or colotomies (9).

Intraoperative enteroscopy, on the other hand, is a technique in which small intestinal examination can be performed by advancing an endoscope from the enterotomy site, mouth, or rectal opening during surgery. It has a diagnostic accuracy of 60%–88% and recurrent bleeding rates ranging between 13% and 60%. Hartmann et al. (10) compared CE and intraoperative enteroscopy in 42 patients and found that CE has a sensitivity of 95%, specificity of 75%, positive predictive value of 95%, and negative predictive value of 86%. A very good correlation has been observed between CE and intraoperative enteroscopy. CE or intraoperative enteroscopy could not be used for our patient because of lack of equipment.

In our case, jejunotomy was performed on the segment where the embolization agents had been placed preoperatively, and the sources of bleeding were observed. The postoperative period was uneventful. There are very few reported cases with isolated jejunal angiodysplasia requiring surgical resection because of a failed attempt to control bleeding using nonoperative methods (11).

CONCLUSION

Angiodysplasias are rare in the jejunum. Although angiodysplasias are generally located in the cecum and ascending colon, isolated jejunal angiodysplasia should be kept in mind during the differential diagnosis of massive lower GI bleeding, and surgeons must be aware of these rare cases and the methods of managing them.

Informed Consent: Written informed consent was obtained from patient who participated in this study.

Peer-review: Externally peer-reviewed.

Author contributions: Concept - M.T.K., A.İ.; Design - M.T.K., G.D., A.İ.; Supervision - M.T.K., M.Y., G.D.; Resource - M.T.K., M.Y.; Materials - M.T.K., G.D.; Data Collection and/or Processing - M.T.K.; Analysis and/or Interpretation - M.T.K., A.İ.; Literature Search - M.T.K., M.Y.; Writing - M.T.K., M.Y.; Critical Reviews - M.T.K., A.İ.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Acute Abdominal Pain with an Unusual Etiology: Splenic Infarction in a Diabetes Patient

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Splenic infarction is a rare clinical event caused by reduced blood flow to the spleen. Its presentation can mimic other causes of acute abdominal pain. The most frequent causes of splenic infarction include thromboembolic events, malignant hematologic neoplasms, and vasculitides. A few reports of single or multiple cases of diabetes-induced splenic infarction have been published in medical journals. Herein, we report a 67-year-old patient with diabetes-associated splenic infarction who presented to an emergency department with acute abdominal pain.

Keywords: Acute abdomen, splenic infarction, diabetes mellitus

INTRODUCTION

Splenic infarction is a relatively rare event in which a portion of the spleen dies due to interruption of the blood supply to the affected tissue for any reason. An interruption in the blood supply can be caused by thrombosis, emboli, changes in blood pressure, twisted blood vessels, trauma, and blood disorders (e.g., leukemia and abnormal blood coagulation). The severity of symptoms depends on the amount of splenic tissue affected (1). Herein, we present a patient with splenic infarction secondary to diabetes mellitus who subsequently developed sterile peritonitis as a cause of acute abdominal pain.

CASE PRESENTATION

A 67-year-old woman with diabetes mellitus was admitted to our hospital complaining of acute abdominal pain in the upper left quadrant, nausea, and vomiting lasting 2 days. Her medical history included congestive heart failure, hypertension, and diabetes mellitus. She was treated with spironolactone. Physical examination on admission revealed palpable splenomegaly. There was tenderness in all quadrants, with guarding and rebound tenderness. During laboratory investigations, the following results were revealed: white blood cell count, 15,700/mm³ (neutrophils, 91%); hematocrit, 43%; hemoglobin, 14.1 g/dL; platelet count, 245,000/mm³; fasting blood glucose, 320 mg/dL; C-reactive protein, 9.63 mg/dL (normal, 0–0.8 mg/dL); lactate dehydrogenase, 1130 U/L (normal, 240–480 U/L); and aspartate transaminase, 61 U/L (normal, 0–38 U/L). There was no gross pathology in her echocardiogram. Computed tomographic (CT) images of the abdomen depicted regions of low attenuation in the spleen that were consistent with acute infarction over nearly three-fifths of the spleen (Figure 1). The patient was transferred to the operating room for emergency surgery. During the surgery, an area of infarct (8x6 cm) was found in the spleen and a total splenectomy was performed. The postoperative period was uneventful and the patient was discharged on postoperative day 5. Informed consent was obtained from the patient who participated in this case.

DISCUSSION

Splenic infarction secondary to diabetes mellitus is a rarely encountered clinical event. Although there are numerous causes of splenic infarct, the majority (88%) of cases involve either infiltrative hematologic diseases, which causes congestion of the splenic circulation by abnormal cells, or thromboembolic conditions, which obstruct larger vessels (2).



FIGURE 1. Abdominal computed tomographic images reveal several areas of low attenuation in the spleen, the largest of which is located superolaterally and posteriorly

The cause of the infarct varies with age; an associated hematologic disorder is more common in patients aged <40 years, whereas an embolic event is more common in patients aged >41 years (3). The clinical spectrum ranges from asymptomatic infarction to hemorrhagic shock and acute abdomen, as in our patient. Approximately one-third of splenic infarcts are clinically occult. In a 10-year retrospective study, Antopolsky et al. (1) examined the clinical presentations in 49 episodes of acute splenic infarction. The most common symptom was abdominal or left flank pain (80% of episodes), while the most common sign was tenderness in the upper left quadrant (35% of episodes). In 16.6% of patients, splenic infarction was the presenting symptom of an underlying disease. Antopolsky et al. (1) also reported that risk factors for splenic infarction were present in 71% of patients. The risk factors included atrial fibrillation in 23% of patients and a history of previous splenic infarction in 8% of patients. Essential hypertension, diabetes mellitus, chronic obstructive pulmonary disease, and chronic heart failure were present in 31%, 23%, 8%, and 8% of patients, respectively. Other symptoms include fever and chills, nausea and vomiting, pleuritic chest pain, and left shoulder pain (Kehr's sign) (1). Septic thromboemboli may result in splenic abscesses, which present with sepsis and left upper abdominal pain. In the case series reported by Nores et al. (2), most of the patients with thromboembolic infarction were symptomatic: 70% of patients with emboli were febrile, and 86% of individuals with thrombosis had abdominal pain.

It is possible that the splenic infarct in our patient was caused by cardiac-related embolization because she had chronic atrial fibrillation and was on oral anticoagulant therapy. However, the echocardiogram revealed no evidence of cardiac-related thromboembolism. Furthermore, all of the postoperative hematologic tests were within the normal ranges. It is unclear whether diabetes itself was the cause of sterile peritonitis in our patient. However, it is well known that severe vascular diseases, extensive atherosclerosis, and thromboembolic events are common in patients with advanced diabetes. Therefore, the prolonged diabetic

state may have facilitated the formation of extensive atherosclerotic lesions in blood vessels, including the splenic artery, which might have led to splenic infarction and resulted in culture-negative peritonitis (4).

The abdominal contrast-enhanced CT scan is the best and most advantageous diagnostic procedure of choice for splenic infarction. It is also more advantageous for the identification of other pathologies. The possibility of splenic infarct should be considered in patients at risk and with non-specific upper left quadrant pain, and a CT scan should be performed (5).

Splenic infarction is caused by ischemic events in the spleen. Patients with diabetes mellitus often have impaired vascular endothelial function, including altered vasomotor activity, vascular smooth muscle cell dysfunction, overproduction of inflammatory cytokines and chemokines, impaired platelet function, and abnormal coagulation. These abnormalities lead to increased vasoconstriction, thrombosis, and inflammation, which may cause splenic infarction (6). It is notable that, owing to the absence of complications (e.g., abscess or pseudocyst formation, hemorrhage, and rupture), splenic infarction was the only cause of acute abdominal pain in our patient.

CONCLUSION

In this case report, we have described a rare presentation of splenic infarction in a patient with diabetes mellitus. As a rare cause of acute abdominal pain, splenic infarction is likely to contribute to the heterogeneous clinical manifestations of diabetes mellitus. Surgery is indicated for patients with complications and for patients with acute abdominal pain.

Informed Consent: Written informed consent was obtained from patient who participated in this study.

Peer-review: Externally peer-reviewed.

Author contributions: Concept - M.Y., M.T.K.; Design - M.Y., M.T.K., G.D.; Supervision - M.Y., M.T.K., A.T.; Resource - M.Y., M.T.K., G.D.; Materials - M.Y., M.T.K., G.D.; Data Collection and/or Processing - M.Y., M.T.K., M.S.; Analysis and/or Interpretation - M.Y., M.T.K., A.T.; Literature Search - M.Y., M.T.K., A.T., M.S.; Writing - M.Y., M.T.K.; Critical Reviews - M.Y., M.T.K., M.S.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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True Aneurysm of the Left Ventricle: An Unusual Location

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Dear Editor,

Ventricular aneurysms mainly occur as a result of transmural myocardial infarction. In contrast to true aneurysms, which always contain myocardial elements in their walls, the walls of false aneurysms are composed of organized hematoma and pericardium. Therefore, false aneurysms are highly likely to rupture, and surgical treatment of these lesions is a priority. Hence, this type of aneurysm should be accurately diagnosed. Differentiation between these two pathologies remains difficult. Here we discuss an atypically located true aneurysm diagnosed by magnetic resonance imaging (MRI).

A 67-year-old male had unexplained sinus tachycardia. He was asymptomatic. He had no acute coronary event and chronic diseases other than diabetes mellitus. The consent of the patient was taken for all medical interventions and scientific studies. The electrocardiogram showed inverted T waves with abnormal Q waves in leads III and aVF; sinus tachycardia was detected. Transthoracic echocardiographic examinations showed the presence of an akinetic cavity connected to the inferior wall that communicated freely with the left ventricle—a preserved global left ventricular systolic function. In the parasternal short-axis view, the cavity had a narrow neck, but in the apical view, it had a broad neck (Figure 1). While the anteromedial wall of the pouch can be selected in the akinetic myocardium, it was not distinguished thrombus or myocardial tissue in the posterolateral wall. Therefore, cardiac MRI was performed to identify the thrombus or myocardial tissue (Figure 2). A true aneurysm (38×40 mm) was detected in MRI. The aneurysm started in the inferior atrioventricular junction of the left ventricle and connected to the left ventricle with a 30-mm mouth. While the thickness of the aneurysm wall was 7 mm in the anterior region, it was 4.6 mm in the posterior region, and there was no significant thrombus within it. Blood flowed from the aneurysm into the left ventricle during diastole and from the left ventricle into the aneurysm during systole.

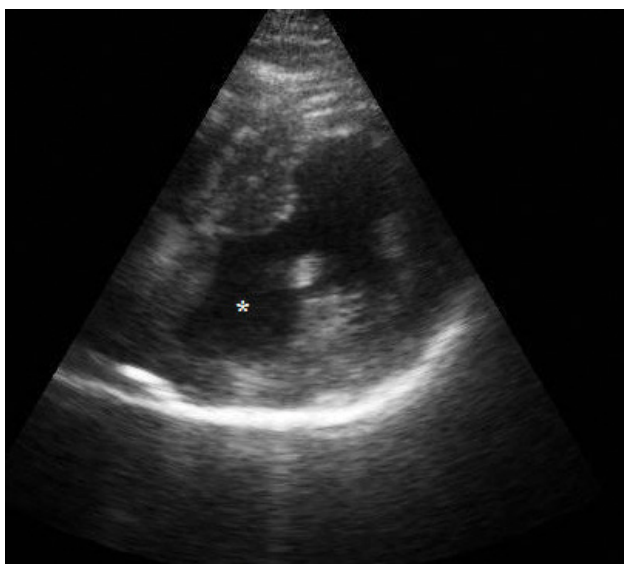


FIGURE 1. Parasternal short-axis view shows a large echo-free space behind the inferior wall that communicates with the left ventricle through a narrow neck

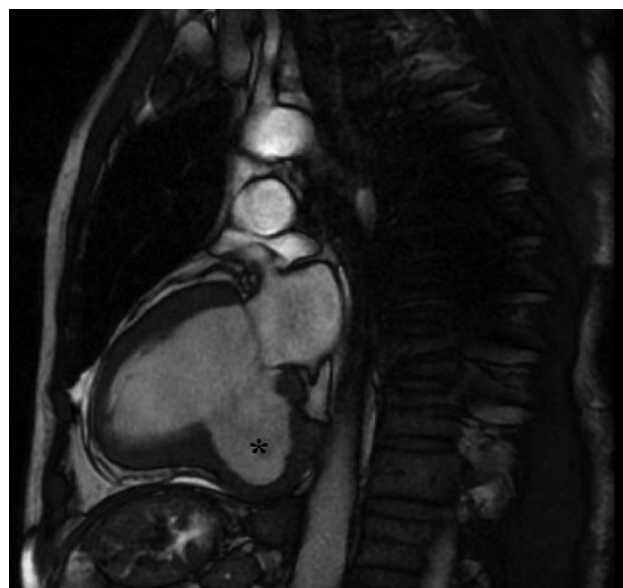


FIGURE 2. MRI shows a large aneurysm containing some myocardial elements in its wall

This study was presented at the Cardio-Spring, Cardio Spring Update, 8-11 May 2014, İzmir, Turkey

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Received: 14.04.2016
Accepted: 26.04.2016

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False aneurysms have been typically reported at the posterior-inferobasal region. True aneurysms are more frequently localized in the anterior or apical region; only about 3% of true aneurysms are located at the posterolateral or diaphragmatic surface (1). True aneurysms do not tend to rupture at the chronic stage. Hence, accurate diagnosis and differentiation of the two entities have important clinical implications. The distinction between a thin mural thrombus and the myocardium may be difficult using both transthoracic and transesophageal echocardiography (2). Cardiac MRI is the most sensitive and specific investigation method used to identify and assess these aneurysms preoperatively (2).

Ethics Committee Approval: N/A

Informed Consent: Written informed consent was obtained from patient who participated in this study.

Peer-review: Externally peer-reviewed.

Author contributions: Concept - F.A., M.Ç.; Design - F.A., S.B.; Supervision - F.A., N.K.; Resource - F.A., S.B.; Materials - F.A., M.Ç., S.B.; Data Collection and/or Processing - F.A., N.K.; Analysis and/or Interpretation - F.A., N.K., S.B.; Literature Search - F.A., N.K.; Writing - F.A., S.B.; Critical Reviews - M.Ç., S.B., F.A.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Endobronchial Metastasis of Gastric Adenocarcinoma

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Dear Editor,

Endobronchial metastasis is rarely seen during the course of extrapulmonary malignant disease. Endobronchial metastases are frequently seen in breast, colon, and renal adenocarcinomas. They are less frequently seen in bladder, skin, thyroid, and pancreatic tumors; ovarian, testicular, and uterine melanomas; and various sarcomas. Pulmonary involvement of stomach cancer is commonly seen as lymphangitis carcinomatosa, pleural effusion, and solitary pulmonary nodule. Its endobronchial metastasis is rarely seen (1).

A 41-year-old male patient presented with complaints of cough, shortness of breath, and wheezing. In anamnesis, he had an operation and received treatments of chemotherapy and radiotherapy 2 years earlier due to gastric adenocarcinoma. In tomography, a nodular formation of 2 cm that extended from the left lower lobe superior to the basal segment was detected in the patient (Figure 1, 2). In bronchoscopy, mucosal irregularity and hyperemia existed at the entrance superior of the left lower lobe. In immunohistochemical staining of a mucosal biopsy, tumor cells stained positive for carcinoembryonic antigen (CEA) and cytokeratin 7 (CK7) and no staining with thyroid transcription factor-1 (TTF1), cluster of differentiation 20 (CD20), caudal-type homeobox 2 (CDX2), or NAPSIN A was detected. Our case was evaluated in keeping with adenocarcinoma metastasis in light of the morphology, clinical history, and immunohistochemical staining (Figure 3).

Ethics Committee Approval: N/A

Informed Consent: N/A

Peer-review: Externally peer-reviewed.

Author contributions: Concept - L.Ö., B.Ö., Y.P.; Design - L.Ö., B.Ö., Y.P.; Supervision - L.Ö.; Resource - L.Ö.; Materials - L.Ö.; Data Collection and/or Processing - L.Ö.; Analysis and/or Interpretation - L.Ö.; Literature Search - L.Ö.; Writing - L.Ö.; Critical Reviews - L.Ö., B.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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FIGURE 1. Tomography of the mediastinum

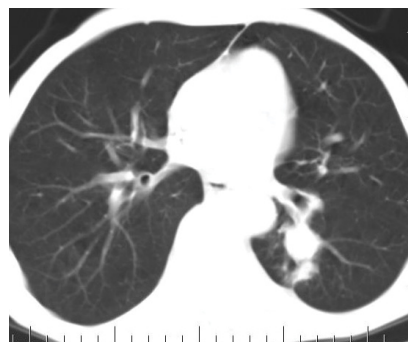


FIGURE 2. Tomography of the parenchyma

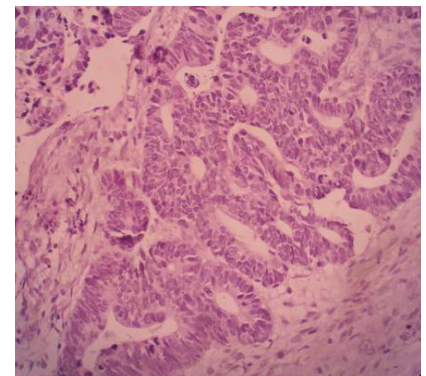


FIGURE 3. Mucosal biopsy

This study was presented at the Thoracic Society 17th Annual Conference, 2-6 April 2014, Antalya, Turkey

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Received: 29.06.2016
Accepted: 30.07.2016

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